SpaceWire Upper Layer Protocols

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Agenda

- **Statement of Purpose**
- **Proposal**
  - Packet Header
  - Packet Header Format
- **Implementation Framework**
- **Working Group**
- **Relationships**
- **Discussion**

Statement of Purpose

- To provide a streamlined approach for developing SpaceWire Upper layer protocols which allows industry to drive standardized communication solutions for real projects

Proposal

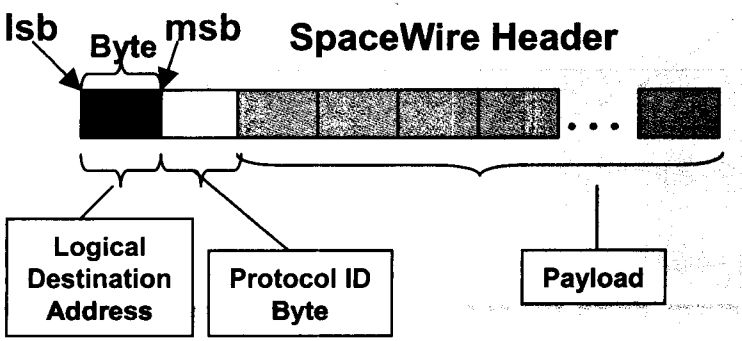
- Agree upon a simple packet header that will allow flexibility in implementing a diverse range of protocols

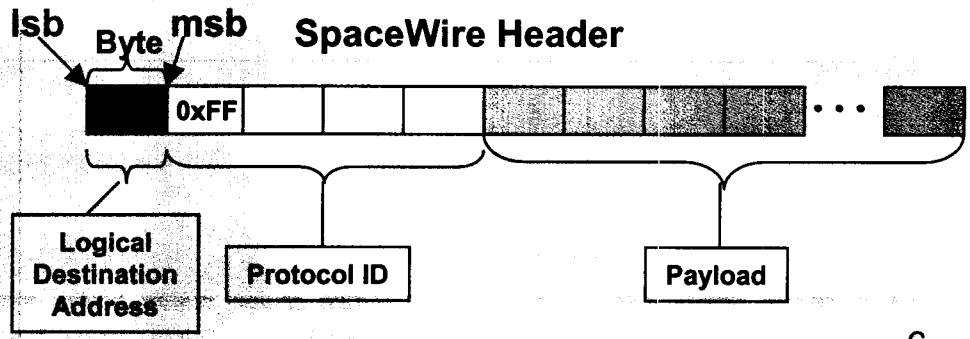
Packet Header

- **Identification of protocol up front**
  - determine packet format and protocol
- **Maintain header & data alignment 4 byte boundaries**
  - Recommendation - not requirement
  - Simplifies processing of packet by User application
  - Pad header so that data starts on four byte boundaries
    - No need to realign bytes by the User application
- **Helpful if SpaceWire User interface can determine if Logical address present or not**
  - Not necessary with agreed upon format!

Packet Header Format

- First byte - SpaceWire Logical Address
- Second byte - Protocol ID
  - Reserved
    - 0x00
    - 0xFF
      - Used to indicate expansion of the Protocol ID to a total of 32 bits (including original Protocol ID byte)
  - Assignment authority
    - ESA initially receives 32 protocol IDs for assignment
    - NASA initially receives 32 protocol IDs for assignment





Implementation Framework

- **Define 2 main working groups to develop SpaceWire protocols**
  - ESA
  - NASA
    - NASA Standard working group
      - Being proposed
        - http://standards.nasa.gov
      - Will be submitted for request to be adopted as a NASA standard
- **Both groups can collaborate but will have independent authority in assigning identification of protocols**
  - Allow independence
  - Allow quicker response
  - Provide for different customer base
- **Reassign Protocol ID if not used for two years**
- **NASA would be the "bridge" to handle ITAR issues for US industry**
  - Allow possible sharing with Europeans
- **Abstract per Protocol submittal to aid in collaboration**

Working Groups

- **ESA SpaceWire Working Group**
- **United States Working Group**
  - NASA
    - GSFC
    - Jet Propulsion Lab (JPL)
    - Glenn Research Center (GRC)
  - Department of Defense (DOD)
  - Lockheed Martin
  - Applied Physics Lab (APL)
  - Northrop Gruman Space Technology (NGST)
  - Honeywell
  - BAE SYSTEMS
  - Aeroflex
  - Etc.

Relationships

- ESA maintains the SpaceWire Standard
- All may be included in working groups but ESA and NASA have independent authority to assign a protocol IDs when in their best interest
- Encourage collaboration